

II. Remarks

Claims 1 through 15 stand rejected. Claims 1, 3, 4, 6, 9, and 14 are being amended, claims 5 and 10 through 13 are being cancelled, and new claim 16 is being added. Accordingly, after entering this amendment, claims 1 through 4, 6 through 9, and 14 through 16 remain pending.

As amended, claim 1 recites a nozzle block that includes a downstream nozzle with a first inlet end, a first outlet end, and a first throat. The dimensions of the first inlet end, the first outlet end, and the first throat define a first geometry. The nozzle block also includes an upstream nozzle with a second inlet end, a second outlet end, and a second throat. The dimensions of the second inlet end, the second outlet end, and the second throat define a second geometry.

In the various illustrated embodiments, the first and second geometries are selected so that both the downstream and upstream nozzles are configured as converging-diverging nozzles to generate supersonic flow. Furthermore, the first geometry and the second geometry are selected to optimize the cleaning energy of the nozzle block, as recited in amended claim 1.

Reconsideration of this application in view of the above amendments and the following remarks is herein respectfully requested.



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Double Patenting

Claims 1 through 15 have been rejected under the judicially created doctrine of double patenting based on claims 1-3, 6, 33-36, 42 and 45-47 of U.S. Patent No. 6,764,030 ('030). A Terminal Disclaimer with regard to '030 in compliance with 37 CFR 1.321(c) is attached hereto. Accordingly, Applicants respectfully request withdrawal of the provisional double patenting rejection.

Claim Rejections - 35 U.S.C. § 112

Claims 1 through 15 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In response, claim 1 has been amended to more clearly define the "first geometry" of the downstream nozzle and the "second geometry" of the upstream nozzle.

Accordingly, it is believed that this rejection is now moot and should be withdrawn.

Claim Rejections - 35 U.S.C. §102(b)

Claims 1, 7, 8 and 14 have been rejected under 35 U.S.C. §102(b) as being anticipated by DE 137814 (referred to herein after as the '814 reference). Claims 1, 8, 14 and 15 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,209,028 to Shenker (Shenker).



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The '814 reference shows a lance tube with a pair of nozzles (2,3). However, neither nozzle is a converging-diverging nozzle that produces supersonic flow. That is, neither nozzle has a respective throat positioned between an inlet end and an outlet end such that the separation between the throat and the outlet end define an expansion zone. Accordingly, the '814 reference does not teach a nozzle block that includes a downstream nozzle with a first geometry defined by the dimensions of the downstream nozzle's inlet end, outlet end, and throat, and an upstream nozzle with a second geometry defined by the dimensions of the upstream nozzle's inlet end, outlet end, and throat. As such, the '814 reference cannot teach a nozzle block that includes a downstream nozzle with a first geometry and an upstream nozzle with a second geometry that are selected to optimize the cleaning energy of the nozzle block, as recited in amended claim 1.

Shenker also shows a lance tube with a pair of nozzles (12,14). However, at least one of the nozzles is not a converging-diverging nozzle that produces supersonic flow since it does not include a throat positioned between an inlet end and an outlet end. Therefore, Shenker does not teach a nozzle block that includes a downstream nozzle with a first geometry defined by the dimensions of the downstream nozzle's inlet end, outlet end, and throat, and an upstream nozzle with a second geometry defined by the dimensions of the upstream nozzle's inlet end, outlet end, and throat. As such, Shenker cannot teach a nozzle block that includes a downstream nozzle with a first geometry and an

upstream nozzle with a second geometry that are selected to optimize the cleaning energy of the nozzle block, as recited in amended claim 1.

Accordingly, since neither the '814 reference nor Shenker teaches each and every element of amended claim 1, reconsideration of the rejection under 35 U.S.C. §102(b) and the allowance of claim 1 are respectfully requested.

Moreover, since claims 2 through 4, 6 through 9, and 14 through 16 depend from claim 1, directly or indirectly, the reasons for the allowance of claim 1 apply as well to the dependent claims.

Conclusion

In view of the above amendments and remarks, it is respectfully submitted that the present form of the claims (claims 1 through 4, 6 through 9, and 14 through 16) are patentably distinguishable over the art of record and that this application is now in condition for allowance. Such action is respectfully requested.

Respectfully submitted by,

Dated: Oct. 27, 2005



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